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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/743,994	01/17/2001	Nobuyuki Doguchi	14198	1525

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02/12/2004

Paul J Esatto
Scully Scott Murphy & Presser
400 Garden City Plaza
Garden City, NY 11530

EXAMINER

LEUBECKER, JOHN P

ART UNIT	PAPER NUMBER
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3739

14

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/743,994

Applicant(s)

DOGUCHI ET AL.

Examiner

John P. Leubecker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 29-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 29-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Status

1. The Finality of the previous Office Action is hereby withdrawn due to the withdrawal of the indication of allowable subject matter. Any inconvenience is regretted.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the embodiment with two solid-state imaging devices must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 30 is objected to because of the following informalities: in claim 30, line 18, "and a mechanism" should be --said mechanism--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 12, 16, 22 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 12, "each solid-state imaging device" suggests a plurality of solid-state imaging devices. However, only one is previously claimed (claim 1).

Claim 16 is indefinite since it appears to contradict itself. The light source unit emits light of wavelengths ranging from ultraviolet to blue, yet further defines the light as at least one of light falling within the visible spectrum (which includes red and green), light ranging from the visible to the near-infrared and light falling within the near infrared.

As to claim 22, recitation of the solid-state imaging device (singular) as comprising two solid-state imaging devices is just plain improper. Claim 1 should recite "at least one" solid-state imaging device to encompass more than one.

As to claim 30, this claim recites **two** rotary filter members which is not mentioned in the disclosure (including drawings). In addition, "the ordinary light" (line 15) lacks antecedent basis. Term "the special light" (line 16) lacks antecedent basis..

Dependent claims where present inherit those defects.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-10, 12, 14-22 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palcic et al. (U.S. Pat. 5,827,190) in view of Hynecek.

Palcic et al. disclose an endoscope apparatus including an endoscope (col.8, lines 38-40), a solid state imaging device (12) in which the amplification factor can be varied (col.9, lines 47-49), a signal processing means (col.10, lines 7-11), a control means for controlling the amplification factor (col.10, lines 2-7). Palcic et al. describes a device wherein increasing the sensitivity (to thereby amplify low intensity signals) unfortunately results in a loss of resolution. Hynecek discloses technology known to one of ordinary skill in the art wherein the sensitivity of the imaging device can be increased (col.4, lines 56-60) without the loss of resolution. It would have been obvious to one of ordinary skill in the art to have provide variable amplification imaging device of Hynecek in the Palcic et al. device to still allow for the detection of low intensity signal without a loss of resolution in the image.

Modification of the Palcic in view of Hynecek would incorporate any necessary control mechanisms taught by Hynecek, as recognized by Applicant on page 12 of the specification.

Note column 9, line 3 to column 10 line 39 of Palcic et al. for operation of the device with respect to the light source unit, switching between modes, detection of fluorescence and normal image signals, and field sequential illumination and imaging. Palcic et al. also suggests use of two imaging devices instead of one (note Figure 3).

8. Claims 1, 2, 4-10, 12, 15, 16, 20, 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi (U.S. Pat. 4,821,117) in view of Hynecek (U.S. Pat. 5,337,340).

Sekiguchi discloses a light source means (7,8), an endoscope (1), a solid state imaging device (11), a signal processing means (40), a control means (42), and a switching means (9). Sekiguchi further discloses a optical path switching means (13a,14a,14a,14b,21,22) and an image intensifier (18) to provide selective normal and amplified images. Thus, Sekiguchi fails to disclose a solid state imaging device in which the sensitivity can be varied by providing a plurality of pulsating driving signals so as to change an electron multiplication rate. However, Hyncek evidences that such is known (note entire patent and particularly col.4, lines 50-60). Armed with this knowledge, and recognizing the fact that a change in the sensitivity of the solid state imaging device of Hyncek would perform substantially the same function as the image intensifier (18) of Sekiguchi (amplifying low level signals), it would have been obvious to the skilled artisan to have provided a solid state imaging device in which the sensitivity can be varied in the Sekiguchi device. It would take mere ordinary skill to recognize that such modification would eliminate the need for the optical path switching means (13a,14a,14a,14b,21,22) and an image intensifier (18) and would require the control means to control the multiplication rate instead of intensifier (10). Reducing the size (eliminating the mirrors, shutters and image intensifier) and otherwise simplifying the device while providing substantially equivalent results with increased S/N ratio provides sufficient motivation for the skilled artisan to make this modification.

Since the control means of Sekiguchi controlled the image intensifier in response to the switching means, any modification to replace the intensifier (10) with the amplifying solid state imaging device as suggested above would clearly and obviously require that the control means control the sensitivity of the solid state imaging device in response to the switching means.

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9. Claims 1-22 and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imaizumi et al. (U.S. Pat. 6,293,911) in view of Hynecek.

Referring mainly to the embodiment shown in Figure 42, Imaizumi et al. discloses a device as substantially as claimed including a iris diaphragm (112) and controller (133), a motorized filter wheel (139) and a switching means (134). Imaizumi et al. disclose that the sensitivity of the imaging device (121) is switched (between normal and fluorescence image) by controlling the exposure time of the imaging element (121, col. 37, lines 47-50). This requires use of a shutter (138). Hynecek discloses an alternative way of controlling the sensitivity of the imaging element (as recognized by Applicant). Use of the Hynecek imaging device would eliminate the need for shutter (138) and necessity to reduce the image frame rate when imaging both normal and fluorescent images. Therefore, it would have been obvious to one of ordinary skill in the art to have provided the multiplication type imaging device of Hynecek in the device of Imaizumi et al. for these reasons. As to claims 32 and 33, note col.37, lines 25-31 of Imaizumi et al.

10. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palcic et al. in view of Hynecek, and further in view of Imaizumi et al (U.S. Pat. 6,293,911).

Palcic et al., as modified by Hynecek, disclose the device as described above wherein light is sequentially and alternately switched and transmitted to the tissue but fails to disclose how this is done. It is well known and conventional in the endoscope art to use a filter wheel to sequentially and alternately transmit the illumination light. Imaizumi et al. is just one prior art reference that evidences that a motorized filter wheel for switching light wavelengths transmitted

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by the light source (note Figures 42 and 43, for example). It would have been obvious to one of ordinary skill in the art to have, when reducing the Palcic et al. device to practice, turned to the prior art to "fill in the gaps" for structure not specifically described in Palcic et al.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sano et al. (U.S. Pat. 6,099,466)—note filter wheel in light source.

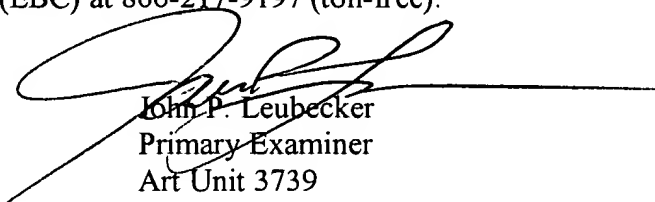
Ozawa et al. (U.S. Pat. 6,217,510) and Cline et al. (U.S. Pat. 6,462,770)—note use of high sensitivity imaging devices for imaging low level images.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Leubecker whose telephone number is (703) 308-0951. The examiner can normally be reached on Monday through Friday, 6:00 AM to 2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda C.M. Dvorak can be reached on (703) 308-0994. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John P. Leubecker
Primary Examiner
Art Unit 3739

jpl